

Borehole

# 30-06-10

Log Event A

## Borehole Information

Farm : <u>C</u>	Tank : <u>C-106</u>	Site Number : <u>299-E27-71</u>
N-Coord : <u>42,963</u>	W-Coord : <u>48,291</u>	TOC Elevation : <u>645.31</u>
Water Level, ft :	Date Drilled : <u>11/30/1972</u>	

## Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>130</u>	

## Borehole Notes:

This borehole was drilled in November 1972 to a depth of 130 ft using 6-in. casing. The drilling report does not indicate if the borehole casing was perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The top of the casing, which is the zero reference for the SGLS, is approximately flush with the ground surface.

## Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1996</u>	Calibration Reference : <u>GJO-HAN-13</u>	Logging Procedure : <u>P-GJPO-1783</u>

## Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>01/29/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>11.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>01/30/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>10.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>24.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>01/30/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>23.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>36.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Log Run Number :	<u>4</u>	Log Run Date :	<u>01/31/1997</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>129.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>45.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>5</u>	Log Run Date :	<u>02/03/1997</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>46.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>35.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

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**Analysis Information**

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Analyst : E. LarsenData Processing Reference : P-GJPO-1787Analysis Date : 05/16/1997**Analysis Notes :**

This borehole was logged by the SGLS in five log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137, Co-60, Eu-154, and U-235 were detected in this borehole. The presence of Cs-137 was measured continuously from the ground surface to a depth of 11 ft, 12 to 17 ft, 45 to 57 ft, 65.5 to 67.5 ft, and at the bottom of the logged interval (128.5 to 129 ft). Isolated concentrations of Cs-137 were detected between 19.5 and 37 ft. The presence of Co-60 was measured continuously from 86 to 116.5 ft. The presence of Eu-154 and U-235 was detected at the ground surface.

An analysis of the shape factors associated with applicable segments of the spectra was performed. The shape factors provide insights into the distribution of the Cs-137 contamination and into the nature of zones of elevated total count gamma-ray activity not attributable to gamma-emitting radionuclides.

The K-40 concentration values increase at 42 ft. Elevated, slightly variable K-40 concentration values were detected from 42.5 to 77 ft. The K-40 concentrations increase at 77 ft, remain elevated to a depth of 122 ft, then decrease toward the bottom of the logged interval. A sharp decrease in the U-238 concentration values occurs at a depth of 36 ft. Decreased Th-232 concentration values occur from 119.5 ft to the bottom of the logged interval.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks C-102, C-106, and C-109.



## Spectral Gamma-Ray Borehole Log Data Report

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### Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

An additional log plot compares spectral gamma data collected with the Radionuclide Logging System (RLS) in 1993 with spectral gamma data collected with the SGLS in 1997. Uncertainty bars and MDLs are not included on these plots.

Plots of the spectrum shape factors are also included. The plots are used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole.